## REMARKS

Claims 14, 15, 16 and 18 have been amended. Claims 17 and 19 have been cancelled. Claims 1-16 and 18 remain pending in the application. Reexamination and reconsideration of the claims, in view of the discussion below, are respectfully requested.

The examiner has rejected claims 14-19 under 35 U.S.C. 101 as directed to non-statutory subject matter. Applicants have amended the form of claims 14, 15, 16 and 18 and canceled claims 17 and 19. It is believed they now overcome this rejection. Furthermore, for the reasons set forth below, it is submitted that claims 14, 15, 16 and 18 are allowable.

The examiner has rejected claim 1 under 35 U.S.C. 103(a) as being unpatentable over Stotts (U.S. Patent No. 4,601,172) in view of Takanasi et al. (U.S. Patent No. 3,660,583), and claims 2-19 in further view of Light (U.S. Patent No. 4,891,569).

Stotts relates to a multiple volume compressor for use in a Stirling engine. However, Stotts does not describe any application for an engine using this compressor, for example, any use in electricity generation. Stotts's disclosure relates entirely to the internal workings of the engine itself and its control. Column 6, lines 9 to 47, explain control of the compressor in general. A pressure transducer (reference numeral 68) provides "actual engine pressure data". This is compared with a desired engine pressure and the difference is determined. This information is used to determine the amount of power available from the engine to drive the compressor during pump down operations. A "power factor logic circuit" (86) calculates a "function of the ratio of tank pressure to engine pressure". This "power factor" is multiplied by the actual engine pressure measured using transducer (68). This determines the amount of power required to drive the compressor at each of the available capacities, which allows the controller to select the capacity "whereby the required compressor power needed for that capacity is less than the power available from the engine".

Hence, this "power factor" in Stotts is clearly not an electrical power factor, since no electrical voltage or current has been described. Rather, Stotts uses this term to mean a completely different quantity than that which an electrical engineer, for instance, would

understand it to mean. Moreover, it is clear from this passage in Stotts that the power factor is determined using a directly measured engine pressure and a measured tank pressure. The determined power factor is then used as part of the engine control system.

Takanasi et al. relates to an electric power supply program for controlling a steel making arc furnace. The optimal power factor of the electrical energy powering the arc furnace varies with respect to the melting stage. The power factor is therefore detected and compared with a preset value. The difference is then used to adjust the current supplied to the furnace.

Light relates to a computer controlled power factor control system. The power factor is measured, and based on this measurement capacitors are switched in or out to change the power factor. If all the capacitors have been activated, or deactivated, an alarm is set.

In contrast, the present invention relates to the determination of engine pressure of a Stirling engine by measuring the power factor of electricity generated using the engine. In this context, the term "power factor" relates to the ratio of the real power to the apparent power in an electrical signal. The present invention, therefore, need only measure the power factor of the generated electricity in order to determine the engine working pressure. The motivation behind the present invention is to avoid the need to take direct engine pressure measurements.

Applicants submit that claims 1, 2, 12 and 14 are not obvious. All of the references lack the feature of comparing the measured electrical power factor with a power factor determined to correspond to the power factor of electricity generated by the engine when operating at a pre-defined pressure. Moreover, Stotts lacks at least the feature of measuring the power factor of electricity generated by the engine to obtain the pressure; instead it measures the pressure directly. Moreover, Takanasi and Light also lack at least the feature of determining the pressure of a gas within an engine relative to a pre-defined pressure of the gas.

As explained above, Stotts relates to a completely different problem to that solved by the present invention. Stotts is concerned with control of a multiple volume compressor in a Stirling engine. The pressure of a working gas in the engine is determined using a pressure sensor. This is exactly the sort of technique the present invention seeks to avoid. The different approach

taken by the present invention uses the engine to generate electricity and the power factor of the generated electricity is measured. As explained above, Stotts uses a term "power factor", but this term has an entirely different meaning to that used in the claims of the present invention. Moreover, this would be immediately recognizable to one of ordinary skill in the art.

Starting from Stotts, the problem facing a person of ordinary skill in the art is how to determine the engine working pressure without taking any direct pressure measurements. The solution provided by the present invention is to measure the power factor of electricity generated by the engine. Neither Stotts, nor any of the other prior art cited by the Examiner, describe an engine which is used to generate electricity. As a result, none of the prior art documents even teach measuring the power factor of electricity generated by an engine, let alone using that measurement to determine the engine pressure. Hence, the claimed invention could not be arrived at in any obvious way based on the references cited by the Examiner.

Moreover, claims 9, 13 and 15 are also patentable over the cited references, since Stotts lacks, at least: measuring repeatedly the power factor of electricity generated by the engine when running; storing the measured power factors; analyzing at least some of the stored power factors to identify any variation across the power factors; and producing an alarm when a variation beyond an acceptable limit is identified. Takanasi et al. and Light both lack at least a method of operating an engine containing a working gas, and the feature of measuring repeatedly the power factor of electricity generated by the engine when running.

Moreover, the claimed invention provides a number of significant advantages. It obviates the need for an additional pressure sensor, which can be expensive and introduces the risk of additional leakage paths; or for a pressure tapping, which does not offer protection for the engine between visits and also introduces potential for leakage. Hence, the present invention would not be obvious based on the documents cited.

Claims 4-8, 10, and 11 are dependent on the independent claims discussed above, and are therefore also patentable.

Consequently, claims 1-16 and 18 are allowable, and Applicants respectfully request that the examiner pass these claims to allowance.

No fee is believed due; however, the Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-0629.

Respectfully submitted,

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Beverly Hopkins — Date: 2-1-08